

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application
No. 09/916,047

For: SYSTEM AND METHOD FOR
FRAME SELECTION IN IP-
BASED CDMA NETWORK

Daley et al.

Examiner: Justin M. Philpott

Filed: July 25, 2001

) Group No. 2665

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APPELLANTS' BRIEF

37 CFR § 1.192

Technology Center 2600

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Examiner Justin M. Philpott

Dear Commissioner:

In response to the Advisory Action dated April 6, 2004, Appellants hereby file a brief on appeal under 37 CFR § 1.192. A Notice of Appeal was filed in the above-reference application on April 13, 2004.

CERTIFICATE OF MAILING/TRANSMISSION (37 CFR 1.8(a))


I hereby certify that this correspondence is, on the date shown below, being:

MAILING

- ☒ deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to Mail Stop Appeal Brief, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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REAL PARTY IN INTEREST

The real party in interest is Qualcomm, Incorporated, assignee of the present application.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF CLAIMS

Claims 7-10, 13-17, 21-23 and 51-55 are the subject of this appeal.

Claim 56 is hereby withdrawn from consideration without prejudice pursuant to MPEP § 1207. Appellants reserve the right to pursue this claim in a continuation application at a later date.

Claims 1-6, 11-12, 18-20 and 24-50 have been cancelled without prejudice by previous amendment.

Claims 7-10, 13-17, 21-23 and 51-56 stand rejected under 35 USC § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,252,862 (Sauer) in view of U.S. Publication No. 2002/0093931 (Dalal). Claims 55 and 56 stand further rejected under 35 USC § 103(a) as allegedly being unpatentable over Sauer in view of Dalal, and further in view of Applicant's admitted prior art.

Claim 7 has been objected to because of minor informalities.¹

STATUS OF AMENDMENTS

An amendment after final rejection was filed by Appellants on March 15, 2004. The Examiner refused to enter the amendment and notified Appellants of this decision in an Advisory Action dated April 6, 2004.

SUMMARY OF THE INVENTION

A. Background

A wireless communications system generally includes a number of base stations (or access points) dispersed throughout a geographic region to provide an interface between a mobile device and a network infrastructure. The geographic region is divided into sub-regions known as cells with each base station (or access point) assigned to a cell. A mobile device in communication with one base station may be handed off to another base station as it enters a new cellular region. To avoid any interruption in communications, a soft handoff procedure may be implemented. Soft handoff is the process of establishing communications with the new base station before breaking communications with the original base station.

As the mobile device moves into a cellular transition region during soft handoff, communications from the mobile device may be received by multiple base stations **101**, **102**, and **103**. (Dalal, FIG. 2 and ¶ 0031). The communications from each base station **101**, **102**, and **103** may be provided to a selection and distribution unit (SDU) **201** on a frame-by-frame basis. *Id.* A frame selection unit **202** within the SDU **201** may be used to select the frame with the best signal quality from the multiple base stations and forward the selected frame to the network infrastructure via a mobile switching center (MSC) **140**. *Id.* In one embodiment disclosed in

¹ The Examiner requires that claim 7 be amended to reflect a “selector entity” that is in communication with a “first access point” rather than a “plurality of access points.” Appellants submit that this requirement is improper. The Examiner has failed to cite any authority that would prohibit Appellants from claiming a “selector entity” that communicates with a “plurality of access points.” Accordingly, Appellants believe that claim 7 is ready for allowance pending the Board’s reversal of the Examiner’s rejections.

Dalal, the SDU **201** functions may be distributed between the MSC **140** and the base station **101**, with the frame selection unit **202** residing in the base station **101**. (Dalal, FIG. 3 and ¶ 0037).

B. Aspects of the Invention

The present invention, as defined in the claims reproduced in Appendix A, is directed to various systems and methods to perform a frame selection function for a mobile device in communication with multiple base stations. In one embodiment of the present invention, the frame selection function may be handed off between base stations as the mobile device moves from cell to cell. (Patent Application, ¶ 0036). This is to be contrasted to Dalal, where the frame selection unit **202** is fixed in the base station **101** regardless of the location of the mobile device. (Dalal, FIG. 3 and ¶ 0037).

The handoff of the frame selection function may be implemented in a way that minimizes the probability of dropped calls. (Patent Application, ¶ 0036). This may be achieved with a selector entity that facilitates the handoff of the frame selection function as the mobile device moves away from an original base station and into the cellular region of a new base station.

The handoff may be initiated when a first threshold is reached indicating that the mobile device is moving into the transition region between the two base stations **42**. (Patent Application, FIG. 3 and ¶ 0038). The first threshold may be based on any suitable network parameter, including by way of example, the strength of the pilot signal between the mobile device and the new base station. (Patent Application, ¶ 0038). Once the handoff is initiated, the selector entity monitors the frame selection function from frames it receives from the original base station and the new base station, but the frame selection function remains with the first base station **44** and **46**. (Patent Application, FIG. 3 and ¶¶ 0039-0040).

As the handoff progresses, a second threshold is reached, which may be a further increase in the strength of the pilot signal between the mobile device and the new base station, or any other suitable network parameter **48**. (Patent Application, FIG. 3 and ¶ 0041). When the second threshold is reached, the selector entity assumes the frame selection function **50**. *Id.* At the same time, or thereabouts, the selector entity prompts the new base station to generate proposed frame selections **50**. *Id.* When the proposed frame selections are correct, the selector entity transfers

the frame selection function to the new base station **52** and **54**. (Patent Application, FIG. 3 and ¶ 0042).

ISSUE

The issues presented for review on appeal are:

1. Whether claims 7-10, 13-17, 21-23 and 51-55 are unpatentable under 35 USC § 103(a) over Sauer (U.S. Patent No. 6,252,862) in view of Dalal (U.S. Publication No. 2002/0093931); and
2. Whether claim 55 is further unpatentable under 35 USC § 103(a) over Sauer (U.S. Patent No. 6,252,862) in view of Dalal (U.S. Publication No. 2002/0093931), and further in view of Applicant's admitted prior art.

GROUPING OF CLAIMS

Each claim which is the subject of this appeal stands or falls on its own.

ARGUMENT

A. The Rejection of Claims 7-10, 13-17, 21-23 and 51-55 is Improper Because the Combination of Sauer and Dalal Does Not Yield the Claimed Invention.

The rejection of claims 7-10, 13-17, 21-23 and 51-55 should be reversed because the Examiner has failed to establish a *prima facie* case of obviousness as required by law. *See In re*

Oetiker, 977 F.2d 1443, 1444 (Fed. Cir. 1992). In particular, the Examiner has failed to cite any combination of references that teach or suggest all the limitations of any one claim pending in this appeal. See *In re Royka*, 490 F.2d 981 (CCPA 1974).

The Patent Office relies primarily on Sauer for disclosing the basic concept of soft handoff in a wireless communications system. The Patent Office then takes the position that Dalal teaches the concept of frame selection, and that it would have been obvious at the time the invention was made to utilize frame selection in Sauer to provide improved transmission quality by selecting the highest quality frames.

Even assuming, *arguendo*, that Sauer and Dalal can be combined in the manner suggested by the Examiner, the resultant combination would still not yield the claimed invention. This is because the claims require more than mere frame selection during soft handoff. The claims require that the frame selection function be handed off to the new base station during soft handoff, and that a “selector entity” facilitate the handoff.

Dalal discloses three base stations **101**, **102** and **103** with the frame select function fixed in the first base station **101**. As the mobile moves through the different cells, the frame selected by the frame selection function will change, however, the frame selection function will always remain in the first base station **101**. It will never be handed off. Accordingly, the Examiner’s reliance on Dalal for disclosing the specific concepts claimed by Appellants for performing a handoff of the frame selection function from one base station to another is misplaced.

1. *Monitoring the Frame Selection Function of the Original Base Station.*

The handoff of the frame selection function is initiated when a first threshold is reached. Claims 7, 10, 17 and 51 each recite a selector entity that monitors the frame selection function by the original base station from frames it receives from both the original and new base stations when the first threshold is reached.

Claim 7 recites a selector entity that:

receives first communication device frames from the first access point . . . and informs a second access point to send frames received thereby to the selector entity when a first threshold is reached.

Claim 7 further recites a selector entity which “monitors frame selection by the first access point,” which may be based on the frames it receives from the first and second access points.

Claims 10, 17 and 51 each recite:

selecting frames from the wireless communication device at the [first or selector base station] . . . sending the selected frames to a selector entity when a first threshold is reached . . . informing a [second or substitute] base station to send frames received thereby to the selector entity

Claims 10, 17 and 51 further recite “monitoring frame selection by the [first base station],” which may be based on the “selected frames” it receives from the first base station and the frames it receives from the second base station.

Claim 55 is directed to the manner in which the selector entity facilitates the frame selection function at the original base station during the initial phase of soft handoff. More specifically, claim 55 recites a selector entity that performs the following functions when the first threshold is reached:

informs a second access point to send frames received thereby . . . receives information frames from the second access point . . . relays the information frames received from the second access point to the first access point for continued frame selection at the first access point. . . .

Dalal discloses a conventional method for soft handoff wherein a mobile device **112** in communication with one base station **101** is handed off to another base station **103** as it enters a new cellular region. When the mobile device **112** initially enters the transition region between the two base stations **101** and **103**, the frame selection unit **202** selects the frames from the original base station **101** until the signal strength between the mobile device **112** and the original base station **101** becomes too weak. When this occurs, the frame selection unit **202** begins

selecting the frames from the new base station **103** to complete the handoff from the original base station **101**. However, at no time prior to handoff does a separate “selector entity” monitor the frame selection function as required by claims 7, 10 and 51, and at no time prior to handoff does a separate “selector entity” route frames from the new base station **103** to the original base station **101** as required by claim 55. Accordingly, Appellants respectfully request that the Examiner’s rejection of claims 7, 10, 17, 51 and 55 be reversed.

Each of the remaining claims that are the subject of this appeal is dependent from either claim 7, 10, 17 or 51, and therefore, are also patentable for the same reasons set forth above. Accordingly, the rejection of all claims pending in this appeal should be reversed.

Notwithstanding the patentability of all pending claims based on the arguments presented thus far, there are a number of additional reasons for patentability addressed below.

2. *Assuming the Frame Selection Function at the Selector Entity.*

As the handoff progresses past the initial phase, a second threshold is reached. Claims 8, 13, 21, and 52 each require a selector entity that assumes the frame selection function when the second threshold is reached. More specifically, claim 8 recites that “the selector entity assumes frame selection for the first communication device, when a second threshold is reached” and claims 13, 21, and 52 each recite “assuming frame selection for the communication device at the selector entity when the second threshold is reached.”

Dalal does not disclose or suggest a “selector entity” that assumes the frame selection function during soft handoff. The frame selection function in Dalal remains with the frame selection unit **202** in the first base station **101** at all times. Accordingly, Appellants respectfully request that the Examiner’s rejection of claims 8, 13, 21 and 52 be reversed.

3. *Monitoring the Frame Selection Function of the New Base Station.*

When the selector entity assumes the frame selection function, or thereabouts, it prompts the new base station to generate proposed frame selections and monitors those frame selections as set forth in claims 8, 14, 22 and 53. Claim 8 further recites a selector entity that:

informs the second access point to propose frame selections for the first communication device and forwards the frame selections to the selector entity for monitoring thereby.

Claim 14 recites:

proposing frame selections for the communication device at the second base station; and forwarding the frame selections to the selector entity for monitoring thereby.

Claims 22 and 53 each recite:

means for informing the substitute base to propose frame selections for the communication device; and means for forwarding the frame selections to the selector entity for monitoring thereby.

Dalal does not disclose a separate “selector entity” that monitors the frame selection function by the new base station **103** for the simple reason that the frame selection function is never transferred to the new base station **103**. The frame selection function remains fixed in the original base station **101** prior to, and after handoff. Accordingly, Appellants respectfully request that the Examiner’s rejection of claims 8, 14, 23, and 52 be reversed.

4. *Transferring the Frame Selection Function to the New Base Station.*

When the proposed frame selections from the new base station are correct, the selector entity may transfer the frame selection function to the new base station as set forth in claims 9, 16, 23 and 54. Claim 9 recites a selector entity that:

determines whether frame selections proposed by the second access point are within a predetermined correctness threshold, and if so, causes the second access point to assume frame selection for the first communication device.

Claim 16 recites:

causing the second base station to assume frame selection for the communication device when frame selections from the second base station are within a predetermined correctness threshold.

Claims 23 and 54 each recite:

means for determining whether frame selections from the substitute base station are within a predetermined correctness threshold; and means for causing the substitute base station to assume frame selection for the communication device when the frame selections from the substitute base station are within a predetermined correctness threshold.

Dalal discloses three base stations **101**, **102** and **103** with the frame select function fixed in the first base station **101**. As the mobile moves through the different cells, the frame selected by the frame selection function will change, however, the frame selection function will always remain in the first base station **101**. It will never be handed off. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 9, 16, 23, and 54 be reversed.

B. The Further Rejection of Claim 55 is Improper Because the Combination of Sauer, Dalal and Appellant's Admitted Prior Art Does Not Yield the Claimed Invention.

Notwithstanding the rejection of claim 55 based on the combination of Sauer and Dalal, the Examiner admits in a separate rejection of claim 55 that the combination of Sauer and Dalal may not disclose the claim limitation requiring an "over-the-air protocol" that is "different from Internet protocol." The Examiner then goes on to reject claim 55 based on the combination of Sauer, Dalal and Appellant's admitted prior art. However, neither rejection can stand because none of the references, either alone or in combination, teach or suggest the concept of handing off the frame selection function from one base station to another.

C. Conclusion.

In view of the foregoing reasons and authorities, Appellants respectfully submit that the rejection of claims 7-10, 13-17, 21-23 and 51-55 is improper and a reversal of the Examiner by the Board is required.

Respectfully submitted,

Dated: 6/1/2004

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APPENDIX A

CLAIMS AS PENDING

1-6. (Cancelled)

7. A voice over Internet (VOIP) system, comprising:

plural access points communicating with plural wireless communication devices using a wireless communication device over-the-air protocol different from Internet protocol (IP), each wireless communication device transmitting frames of information,

at least a first access point undertaking selection functionality including frame selection and handoff control; and

a selector entity in communication with the access points,

wherein the selector entity receives first communication device frames from the first access point, monitors frame selection by the first access point for the first communication device, and informs a second access point to send frames received thereby to the selector entity when a first threshold is reached.

8. The system of Claim 7, wherein the selector entity assumes frame selection for the first communication device when a second threshold is reached, and informs the second access point to propose frame selections for the first communication device and forwards the frame selections to the selector entity for monitoring thereby.

9. The system of Claim 8, wherein the selector entity determines whether frame selections proposed by the second access point are within a predetermined correctness threshold, and if so, causes the second access point to assume frame selection for the first communication device.

10. A method for frame selection in a wireless communication infrastructure, comprising:

establishing communication between at least a first base station and at least one wireless communication device using a non-Internet protocol over-the-air protocol, the first base station being one of a plurality of base stations in the infrastructure;

selecting frames from the wireless communication device at the first base station; and

sending the selected frames to a selector entity when a first threshold is reached, the selector entity monitoring frame selection by the first base station and informing a second base station to send frames received thereby to the selector entity.

11-12. (Cancelled)

13. The method of Claim 10, further comprising:

assuming frame selection for the communication device at the selector entity when a second threshold is reached.

14. The method of Claim 13, further comprising:

proposing frame selections for the communication device at the second base station; and
forwarding the frame selections to the selector entity for monitoring thereby.

15. The method of Claim 14, further comprising determining whether frame selections from the second base station are within a predetermined correctness threshold.

16. The method of Claim 15, further comprising causing the second base station to assume frame selection for the communication device when frame selections from the second base station are within a predetermined correctness threshold.

17. A computer program product, comprising:
means for dynamically establishing a selector base station in a wireless telephony infrastructure, the infrastructure using Internet protocol;
means for establishing over-the-air communication between at least one base station in the infrastructure and a wireless communication device;
means for selecting frames from the wireless communication device at the selector base station;
means for sending the selected frames to a selector entity when a first threshold is reached;
means for monitoring frame selection by the selector base station; and
means for informing a substitute base station to send frames received thereby to the selector entity, before handing off the selecting of frames of information from the wireless

communication device from the selector base station to the substitute base station upon reaching a second threshold.

18-20. (Cancelled)

21. The product of Claim 17, further comprising:
means for assuming frame selection for the communication device at the selector entity when the second threshold is reached.

22. The product of Claim 21, further comprising:
means for informing the substitute base station to propose frame selections for the communication device; and
means for forwarding the frame selections to the selector entity for monitoring thereby.

23. The product of Claim 22, further comprising:
means for determining whether frame selections from the substitute base station are within a predetermined correctness threshold; and
means for causing the substitute base station to assume frame selection for the communication device when frame selections from the substitute base station are within a predetermined correctness threshold.

24-50. (Cancelled)

51. An apparatus for frame selection in a communication infrastructure, comprising:

- means for dynamically establishing a selector base station in a wireless telephony infrastructure, the infrastructure using Internet protocol;
- means for establishing over-the-air communication between at least one base station in the infrastructure and a wireless communication device;
- means for selecting frames from the wireless communication device at the selector base station;
- means for sending the selected frames to a selector entity when a first threshold is reached;
- means for monitoring frame selection by the first base station; and
- means for informing a second base station to send frames received thereby to the selector entity, before handing off the selecting of frames of information from the communication device from the selector base station to the substitute base station upon reaching a second threshold.

52. The apparatus of Claim 51, further comprising:

- means for assuming frame selection for the communication device at the selector entity when the second threshold is reached.

53. The apparatus of Claim 52, further comprising:

- means for informing the substitute base station to propose frame selections for the communication device; and

means for forwarding the frame selections to the selector entity for monitoring thereby.

54. The apparatus of Claim 53, further comprising:

means for determining whether frame selections from the substitute base station are within a predetermined correctness threshold;

means for causing the substitute base station to assume frame selection for the communication device when frame selections from the substitute base station are within a predetermined correctness threshold.

55. A voice over Internet (VOIP) system, comprising:

plural access points communicating with plural wireless communication devices using a wireless communication device over-the-air protocol different from Internet protocol (IP), each wireless communication device transmitting frames of information,

at least a first access point undertaking selection functionality including frame selection and handoff control; and

a selector entity in communication with the access points, wherein, when a first threshold is reached, the selector entity:

receives information frames from the first access point;

informs a second access point to send frames received thereby to the selector entity;

receives information frames from the second access point; and

relays the information frames received from the second access point to the first access point for continued frame selection at the first access point.

56. (Withdrawn) A method for frame selection in a wireless communication infrastructure, comprising:

establishing communication between at least a first base station and at least one wireless communication device using a non-Internet protocol over-the-air protocol, the first base station being one of a plurality of base stations in the infrastructure;

selecting frames from the wireless communication device at the first base station; and

when a first threshold is reached, a selector entity in communication with the first base station:

informing a second base station to send frames received thereby to the first station;

receiving information frames from the second access point; and

relaying the information frames received from the second access point to the first access point for continued frame selection at the first access point.



**BEFORE THE OFFICE OF ENROLLMENT AND DISCIPLINE
UNITED STATES PATENT AND TRADEMARK OFFICE**

LIMITED RECOGNITION UNDER 37 CFR § 10.9(b)

Arti Kane is hereby given limited recognition under 37 CFR § 10.9(b) as an employee of QUALCOMM Incorporated to prepare and prosecute patent applications wherein QUALCOMM Incorporated is the assignee of record of the entire interest. This limited recognition shall expire on the date appearing below, or when whichever of the following events first occurs prior to the date appearing below: (i) Arti Kane ceases to lawfully reside in the United States, (ii) Arti Kane's employment with QUALCOMM Incorporated ceases or is terminated, or (iii) Arti Kane ceases to remain or reside in the United States on a H1B1 visa.

This document constitutes proof of such recognition. The original of this document is on file in the Office of Enrollment and Discipline of the United States Patent and Trademark Office.

Expires: May 5, 2005

**Harry I. Moatz
Director of Enrollment and Discipline**

AF/2665
7

AMENDMENT TRANSMITTAL FORM

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450Customer No.: 23696
Attorney Docket No.: 010278
In Re Application of: Daley et al.
Serial Number: 09/916,047
Filed: July 25, 2001
Examiner: Justin M. Philpott
Group Art Unit: 2665

Dear Sir:

Transmitted herewith for filing is an Appeal Brief in triplicate in the above identified application.

- ☐ Applicant is a small entity - a verified statement
☐ is enclosed.
☐ has already been filed.

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In addition to the Appeal Brief, the following documents are enclosed:

- ☒ Appendix A (claims as appealed)
☐ Appendix B
☐ Appendix C

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5. ☐ Fee check in the amount of \$_____ is enclosed to pay for any claim and/or extension fees.
6. ☒ Please charge Deposit Account No. 17-0026 of QUALCOMM Incorporated the amount of \$330.00.
The Commissioner is hereby authorized to charge payment of any additional fees which may be required, or credit any overpayment to said Deposit Account No. 17-0026. A duplicate of this sheet is enclosed for fee processing.
7. ☒ The Commissioner is further hereby authorized to charge to said Deposit Account No. 17-0026, pursuant to 37 CFR 1.25(b), any fee whatsoever which may become properly due or payable, as set forth in 37 CFR 1.16 to 37 CFR 1.18 inclusive, for the entire pendency of this application without specific additional authorization.

Date: 6/1/2004

Signature:

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